### IN THE CLAIMS

- 1. (Previously presented) Apparatus for secure management of data in a computer controlled storage system comprising:
- a trusted data management server (tdm server), responsive to a user or user program application, capable of storing data in and retrieving data from a storage system that comprises:

security structure generator means to generate the following security management structures:

a unique identifier for said data;

access control information for said data;

a data signature for authenticating said data from said data and said unique

identifier; and

an access control information signature for authenticating said access control information from said access control information and said unique identifier.

2. (Previously presented) The apparatus of claim 1 further comprising: encryption means for encrypting:

said data; and

said access control information, when required by said tdm server.

- 3. (Original) The apparatus of claim 2 wherein said encryption means is adapted to encrypt said data and said access control information.
- 4. (Previously presented) The apparatus of claim 2 further comprising: storage control means for causing said storage system to store said security management structures and said data.
  - 5. (Original) The apparatus of claim 4 wherein said data is stored in encrypted form.

- 6. (Previously presented) The apparatus of claim 5 further comprising: access control means for accessing said data stored in said storage system with said unique identifier
- 7. (Previously presented) The apparatus of claim 6 wherein said access control means comprises:

means responsive to a request from an  $\underline{a}$  user for accessing secured data from said storage system, adapted to:

retrieve a unique identifier for said data from said user or storage system;

retrieve from said storage system said security management structures corresponding to said data; and

carry out the following determination steps:

determine if said access control information and unique identifier correspond with said access control information signature;

determine if said data and its unique identifier correspond with said data signature; determine if said unique identifier of said access control information corresponds with said unique identifier of said secured data; and

determine whether said access control information permits said user to access said secured data; and then grant access to said user to said data if each of said determination steps is satisfied, and otherwise refuse access.

- 8. (Original) The apparatus of claim 7 wherein said access control means further includes means to notify said user if access is refused.
  - 9. (Canceled)
  - 10. (Canceled)

#### 11. (Canceled)

12. (Previously presented) A method for secure management of data in a computer controlled storage system comprising:

in a trusted data management server (tdm server), responsive to a user or user program application, for storing data in and retrieving data from a storage system generating the following security management structures:

a unique identifier for said data;

access control information for said data;

a data signature for authenticating said data from said data and said unique identifier;

and

an access control information signature for authenticating said access control information from said access control information and said unique identifier.

- 13. (Original) The method of claim 12 further comprising: encrypting said data, or said access control information.
- 14. (Original) The method of claim 13 comprising encrypting said data and said access control information.
  - 15. (Previously presented) The method of claim 13 further comprising: causing said storage system to store said security management structures and said data.
  - 16. (Original) The method of claim 15 wherein said data is stored encrypted
  - 17. (Original) The method of claim 16 further comprising: accessing said data stored in said storage with said unique identifier

18. (Previously presented) The method of claim 16 responsive to a request from a user for accessing data from said storage system, retrieving a unique identifier for said data from said user or database storage;

retrieve from said storage system said security management structures corresponding to said secured data; and

carrying out the following determination steps:

determine if said access control information and its unique identifier correspond with said access control information signature;

determine if said secured data and its unique identifier correspond with said data signature; determine if said unique identifier of said access control information corresponds with said secured data; and

determine whether said access control information permits said user to access said secured data; and then granting access to said user to said data if each of said determination steps is satisfied, and otherwise refusing access.

- 19. (Original) The method of claim 18 including notifying said user if access is refused.
- 20. (Canceled)
- 21. (Canceled)
- 22. (Canceled)
- 23. (Previously presented) Computer readable storage means for storing instructions for use in the execution in a computer system of the method of claim 13.

- 24. (Previously presented) Computer readable storage means for storing instructions for use in the execution in a computer system for causing the computer system to effect the apparatus of claim 1.
  - 25. (Canceled)
  - 26. (Canceled)
- 27. (Previously presented) An article of manufacture comprising a computer usable medium having computer readable program code means embodied therein for causing secure management of data in a computer controlled storage system, the computer readable program code means in said article of manufacture comprising computer readable program code means for causing a computer to effect the steps of claim 12.
  - 28. (Canceled)
  - 29. (Canceled)
- 30. (Previously presented) A method for storing a document in a secure storage system comprising the steps of:

submitting the document for secure storage;

generating a random number at a trusted document management server;

requesting a database management system to reserve the generated random number as a document key;

computing a digital document signature at the trusted document management server, wherein the document signature is capable of authenticating document content and the document key;

creating an initial access control list (ACL) at the trusted document management server;

computing a digital ACL signature at the trusted document management sever, wherein the ACL signature is capable of authenticating ACL content and the document key; and instructing the database management system to store the document, the document signature, the ACL and the ACL signature.

31. (Canceled)